Seafood consumption during pregnancy and child neurodevelopment in a population-based longitudinal study: the INMA cohorts

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Background and Aims: Maternal seafood consumption during pregnancy has been associated with higher neurodevelopment scores in children. However, seafood is also an important source of contaminants associated with lower scores. As most studies to date have been conducted in populations with limited intakes, few have been able to examine how different seafood subtypes, which vary in content of both potentially beneficial fatty acids and neurotoxic contaminants, are associated with child development. This study, conducted in a sample with high seafood intakes, aims to address this gap.

Methods: The analysis included 1,895 women recruited during the first trimester of pregnancy as part of the multicenter Spanish INMA Childhood and Environment cohort in Asturias, Gipuzkoa, Sabadell, and Valencia. Trained psychologists assessed child neurodevelopment at approximately 14 months using the Bayley Scales of Infant Development, standardized for standardized for age in days at test administration. Multivariate linear regression was used to assess associations between test scores and maternal seafood intakes, classified as small fatty fish, large fatty fish, lean fish, and shellfish. Models adjusted for confounders including breastfeeding and parity; the effect of additionally adjustments and cord blood mercury and polychlorinated biphenyls and dichloro-diphenyldichloroethylene in 1st trimester maternal serum was examined.

Results: Mean seafood intakes were 4.5 times per week. First trimester intakes of small fatty fish ≥1 time/week, lean fish up to 3 times/week, and shellfish up to twice a week were positively and significantly associated with cognitive scores. Large fatty fish ≥1/week was associated with lower scores overall, though associations were heterogeneous across cohorts. Additionally adjusting for contaminants had no meaningful effect.

Conclusions: Results suggest maternal consumption of most types of seafood is largely beneficial for child neurodevelopment, but support current recommendations to limit intakes of large fatty fish species which may accumulate high levels of both mercury and lipophilic contaminants.